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PAPER OR PAPER-LIKE OBJECTS

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PAPER OR PAPER-LIKE OBJECT

[Papier oder papierähnlicher Gegenstand]

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The invention pertains to paper or a paper-like object.

The addition of different materials and substances during the manufacture of paper is generally known. These materials are added to the raw paper mass that usually consists of chemical pulp, e.g., pine pulp, and fillers such as CaCO_3 , or the finished paper is coated correspondingly. The partial replacement of conventional chemical pulps with starch fibers is known from German Patent No. 2,713,311. Pretreated wheat flour in a suspension with microcapsules serves for coating special paper that is used in pressure-sensitive imaging systems according to German Patent (ALS) No. 2,249,798. European Patent No. 0,038,884 describes the manufacture of wall coverings with a structured surface, with the paper that is coated with a foamed polymer mixture containing wood splinters with a length of approximately 7 mm and a thickness between 0.5 and 1.8 mm in order to produce relief structures.

Consequently, these known additives are used for special paper or applications or for reducing the required quantity of chemical pulp.

The invention is based on the objective of disclosing paper or paper-like objects that can be used for essentially all known intended purposes, with said paper or paper-like objects having coloring effects and certain patterns as well as an advantageous biological decomposability. In addition, this type of paper can be recycled or disposed of so that little noxious matter is produced.

This objective is attained with the characteristics disclosed in Claim 1.

The paper or paper-like object according to the invention comprises solid components of fruits or seeds, in particular bran, which are incorporated into the finished product and are visible therein.

These solid components can be added to the raw paper mass during the different production steps carried out in the manufacture of paper, with the percentage of said components being up to 70%, in particular between 10 and 40%, with respect to the raw paper mass. The paper or paper board produced in this way can be used for all conventional packagings and other known purposes, e.g., paper impregnated with synthetic resin, packages, etc. It is, for example, possible to print and write on the paper or paper-like object according to the invention or use said paper as copier paper. Depending on the type of plant and the size of the solid components, optical and structural effects are produced on the paper due to the addition of solid components of fruits and seeds. Paper with a smooth surface which can be subsequently calendered or paper with surface structures can be produced in dependence on the range of the grain size of the components used. When selecting the solid components, the structure and the physicochemical properties (swelling, volume contraction during the drying process) of the respective paper to be manufactured need to be observed.

The printing of the paper according to the invention can, if so desired, be relinquished due to its optical effect. The addition of dyes during paper manufacture can also be eliminated, so that an advantageous disposal in which only little noxious matter is produced can be insured. The components that are incorporated into the paper and are visible therein are of

vegetable origin, so that a superior biological decomposability of the paper is, particularly if using brans, insured due to the content of nutrients, trace elements, etc. The structuring of the paper in which the individual particles are not very rigidly bonded to the raw paper mass additionally promote decomposition. However, the paper according to the invention does not only have very good decomposition characteristics, but can also be recycled.

In the paper according to the invention, the solid, visible components of fruits or seeds are arranged in scattered fashion, with said scattered arrangement being very irregular, i.e., the individual sheets can be identified in accordance with the distribution and arrangement of the solid components. Two identical sheets are, in principle, not produced, so that even copied sheets can still be distinguished or identified in accordance with their pattern.

Due to the addition of solid components, which can be up to 70%, but, depending on the intended use of the paper and the components used, can also amount to higher percentages, it is also possible to reduce the required quantities of chemical pulp and/or fillers. Smaller quantities of mineral ash are accumulated during incineration if, for example, the CaCO_3 content of the paper is reduced.

Brans, e.g., semolina bran and/or seed husks or fruit peels and/or corn husks, and grains or parts thereof can be used in treated or untreated form as the solid components of fruits or seeds. These components can be obtained from any given plant, e.g., corn or legumes. In addition, oil seeds, cocoa and soy

husks or germs, e.g., malt rootlets, can be used. The type of solid components or the mixture thereof as well as the type of plant needs to be selected in dependence on the intended use of the paper, in particular the desired optical and/or structural effects. The solid components can be pretreated in a thermic or hydrothermic fashion if so desired.

Depending on the desired structure and grain size, the individual components can be enriched or depleted in fractions by means of comminution and separation measures (grinding, sieving). However, this can also be realized by means of different processing methods, e.g., malting (malt-semolina bran, malt bran). The brans obtained in this way can, for example, be comminuted additionally after the sieving process, sieved again or processed in a different fashion. Table I shows one example of the grain size distribution for brans that were sieved and divided into three fractions.

Table I

1 Typische Kleie-Siebanalyse, gesichtet im Jol-Sichter, 5 Minuten mit Siebhilfe			
2 Korngröße μm	3 grob	4 Fraktion (%) mittel	5 fein
> 1120	50-100	0-20	0-5
1010	0-40	0-20	0-5
750	0-30	0-20	0-5
630	0-20	0-30	0-5
500	0-10	0-50	0-5
400	0-5	0-50	0-10
315	0-5	0-30	0-20
200	0-5	0-20	0-30
125	0-5	0-20	0-40
< 125	0-5	0-20	50-100

Key: 1 Typical bran sieve analysis, sifted in a Jel-sifter for
5 min with a sieving aid
2 Grain size in μm
3 Coarse
4 Average fraction (%)
5 Fine

According to Table I, a bran fraction can be considered as a coarse fraction if more than 50% of the components have a size in excess of 1120 μm . The average fraction can contain up to 20% and the fine fraction up to 5% of these components. The values indicated in Table I are based on several sieve analyses of different brans, with deviations between these values and other grain size determinations (sieving methods) being possible.

Figures 1-3 show paper samples according to the invention into which average and coarse bran and peel fractions are incorporated in accordance with Table I, with the paper according to Figure 1 containing semolina bran of an average fraction, the paper according to Figure 2 containing a coarse rye bran and the paper according to Figure 3 containing a very coarse wheat-malt bran. The paper according to Figure 3 in particular may contain components that correspond to the size of one grain.

Embodiments of the paper according to the invention are described in detail below.

A sample of wheat-malt bran as well as four fractions thereof (fine, average, coarse, very coarse) which were produced by means of sieving were sifted in the Jel-sifter. The results are indicated in Table II. The individual fractions were respectively added to the raw paper masses during the manufacture of the paper. The papers produced according to Figures 4-7

contain 70% of chlorine-free, bleached chemical pulp and 30% of the fractions according to Table II.

Figure 4 shows a paper that contains the fine fraction, Figure 5 shows a paper that contains the average fraction, and the papers according to Figures 6 and 7 show papers that contain the coarse and very coarse fraction according to Table II.

The papers shown can be used for all known intended purposes, with the paper according to Figure 5 being particularly suitable as writing paper after being calendered.

Table II

(Siebanalyse einer Weizenmalzkeim-Probe und der daraus hergestellten Fraktionen					
Korngröße μm	fein	4 Fraktion (%)		sehr grob	Probe
2	3	5 mittel	6 grob	7	8
> 1120	0.2	16.3	71.8	97.7	38.1
1010	1.6	37.1	20.5	0.8	11.2
750	13.7	31.5	3.9	0.2	10.4
630	14.3	4.9	0.5	0.1	6.5
500	9.7	1.8	0.4	0.1	3.9
400	25.2	2.6	0.5	0.1	10.4
315	7.5	0.9	0.2	0.1	3.1
200	10.9	0.5	0.3	0.1	4.9
125	10.3	0.7	0.2	0.1	5.0
< 125	6.6	3.7	1.7	0.7	6.5

Key: 1 Sieve analysis of a wheat-malt germ sample and the fractions produced thereof
 2 Grain size in μm
 3 Fine
 4 Fraction (%)
 5 Average
 6 Coarse

7 Very coarse
8 Sample

Claims:

1. Paper or paper-like object, characterized by the fact that it contains incorporated and visible components of grains, pseudo-grains, legumes or oil seeds.

2. Paper or paper-like object according to Claim 1, characterized by the fact that bran mixtures are used.

3. Paper or paper-like object according to Claim 1 or 2, characterized by the fact that the bran of different grain types is used.

4. Paper or paper-like object according to Claim 3, characterized by the fact that the bran is malt, semolina or corn husk bran.

5. Paper or paper-like object according to one of Claims 1-4, characterized by the fact that it contains visible components of fruits or seeds.

6. Paper or paper-like object according to Claim 1, characterized by the fact that the percentage of the solid components of fruits or seeds is up to 70% with respect to the raw paper mass.

7. Paper or paper-like object according to Claim 5, characterized by the fact that the percentage of the solid components of fruits or seeds is between 10 and 40%.

8. Paper or paper-like object according to Claim 1, characterized by the fact that fruit peels and/or seed husks are used.

9. Paper or paper-like object according to Claim 1, characterized by the fact that treated or untreated grains or parts thereof are used.

10. Paper or paper-like object according to one of Claim 1, characterized by the fact that the solid components of fruits or seeds are pretreated in thermic or hydrothermic fashion.

11. Paper or paper-like object according to Claim 1, characterized by the fact that the solid components of fruits or seeds are comminuted, in particular ground.

12. Paper or paper-like object according to one of Claim 1, characterized by the fact that the solid components of fruits or seeds are fractionated, in particular sieved.

13. Paper or paper-like object according to one of Claim 5, characterized by the fact that individual or mixed components of fruits or seeds that were enriched in fractions according to their size are used.

FIG. 1

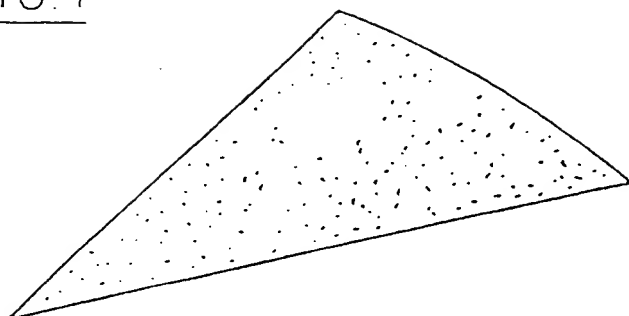


FIG. 2

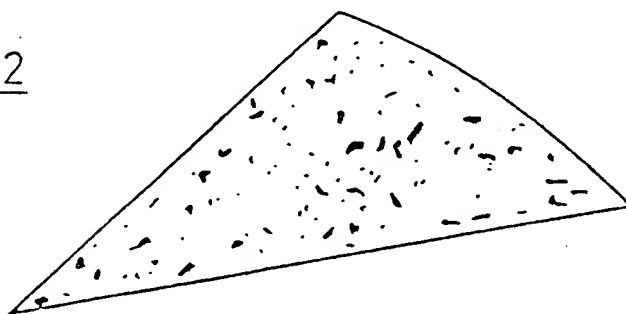


FIG. 3

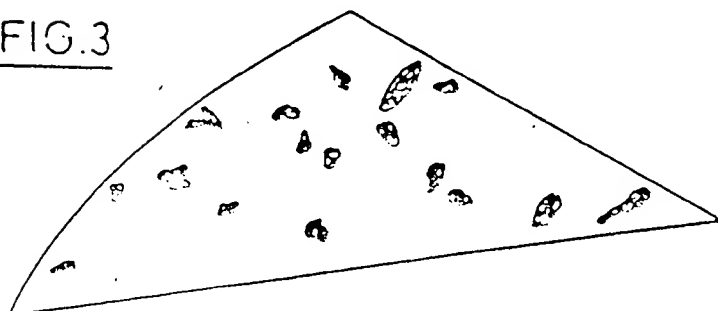


FIG. 4



FIG. 5

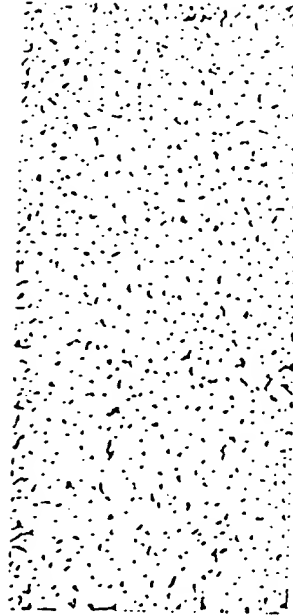


FIG. 6



FIG. 7



EUROPEAN SEARCH REPORT

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int Cl ⁵)
X	DATABASE WPIL Section Ch, Week 8931, Derwent Publications Ltd., London, GB; Class F02, AN 89-225561 & JP-A-1 162 839 (ABEKAWA SEISHI KK) 27. Jun 1989 * Abstract *	1-13	D21H17/02 D21H27/02
Y	US-A-1 724 522 (SEREBRIANOV) * Entire document *	1	
			TECHNICAL FIELDS SEARCHED (Int Cl ⁵) D21H
The present search report has been drawn up for all claims.			
Place of search The Hague		Date of completion of the search March 17, 1993	Examiner SONGY Odile
CATEGORY OF CITED DOCUMENTS X: Particularly relevant if taken alone. Y: Particularly relevant if combined with another document of the same category. A: Technological background. O: Non-written disclosure. P: Intermediate document T: Theory or principle underlying the invention. E: Earlier patent document, but published on, or after the filing date. D: Document cited in the application. L: Document cited for other reasons. &: Member of the same patent family, corresponding document			